

What is claimed is:

1. A method of diagnosing attention deficient-hyperactivity disorder (ADHD) in a human patient comprising assessing dopamine transporter in at least one region of said patient's central nervous system, wherein an elevated level of dopamine transporter in said patient is indicative of ADHD.

2. The method of claim 1 wherein said assessment is by PET or SPECT imaging.

3. The method of claim 1, further comprising administering to the patient a labeled dopamine transporter ligand and wherein the assessment comprises determining the amount of labeled dopamine transporter ligand that is bound to dopamine transporter.

4. The method of claim <sup>should be 3</sup> 2, wherein the method further comprises the step of comparing the amount of labeled dopamine transporter ligand that is bound to dopamine transporter with a control.

5. The method of claim 3, wherein the dopamine transporter ligand comprises a compound that binds to the dopamine transporter.

6. The method of claim 3, wherein said dopamine transporter ligand comprises [<sup>11</sup>C]CFT ([<sup>11</sup>C]WIN 35,428).

7. The method of claim 6, wherein said assessment comprises imaging by PET.

8. The method of claim 3, wherein said dopamine transporter ligand comprises [<sup>11</sup>C]altropine.

9. The method of claim 8, wherein said assessment comprises imaging by PET.

10. The method of claim 3, wherein said ligand comprises [<sup>123</sup>I]altropane and said assessment comprises imaging by SPECT.

11. The method of claim 3, wherein said ligand comprises a technetium-labeled phenyltropane probe.

12. The method of claim 11, wherein said ligand comprises [<sup>99m</sup>Tc]technepine, O-1505.

13. The method of claim 12, wherein said assessment comprises imaging by SPECT.

14. The method of claim 1, wherein said at least one region of said patient's central nervous system comprises a portion of the brain.

15. The method of claim 14, wherein said portion of the brain comprises the striatum.

16. The method of claim 1, further comprising administering to the patient a labeled dopamine transporter ligand, the assessing step comprises assessing dopamine transporter availability, and the method further comprises comparing dopamine transporter availability with the dopamine transporter availability in a control, wherein a higher dopamine transporter availability in said patient is indicative of ADHD.

17. The method of claim 1, further comprising administering to the patient a labeled dopamine transporter ligand, the assessing step comprises determining dopamine transporter binding potential and the method further comprises comparing dopamine transporter binding potential with the dopamine transporter binding potential in a control, wherein a higher dopamine transporter binding potential in said patient is indicative of ADHD.

18. A method of determining the effectiveness of an ADHD treatment for a human patient, the method comprising:

- a) assessing an initial dopamine transporter level in at least one region of said patient's central nervous system;
- b) applying the treatment;
- c) assessing a subsequent dopamine transporter level in said at least one region of said patient's central nervous system; and
- d) comparing the dopamine transporter level in step (a) with the dopamine transporter level in step (c), wherein a decrease in dopamine transporter levels indicates that the treatment is effective.

19. The method of claim 18, further comprising administering to the patient a labeled dopamine transporter ligand before at least one of the assessing steps, and wherein the assessing comprises determining the amount of labeled dopamine transporter ligand that is bound to dopamine transporter.

20. The method of claim 19, wherein the dopamine transporter ligand comprises a compound that binds to the dopamine transporter.

21. The method of claim 18, wherein the second assessing step occurs two weeks or more after the applying step.

22. The method of claim 18, wherein the treatment comprises a pharmaceutical treatment.

23. The method of claim 18, wherein the pharmaceutical treatment comprises administration of a pharmaceutical selected from the group consisting of methylphenidate, pemoline, and an amphetamine.

24. The method of claim 18, wherein the assessing step comprises PET or SPECT imaging.

25. The method of claim 18, further comprising administering to the patient a labeled dopamine transporter ligand before at least one of the assessing steps, the assessing steps comprise assessing dopamine transporter availability, and the comparing step comprises comparing dopamine transporter availability in step (a) with the dopamine transporter availability in step (c), wherein a lower dopamine transporter availability in step (c) indicates that the treatment is effective.

26. The method of claim 18, further comprising administering to the patient a labeled dopamine transporter ligand before at least one of the assessing steps, the assessing steps comprise assessing dopamine transporter binding potential, and the comparing step comprises comparing dopamine transporter binding potential in step (a) with the dopamine transporter binding potential in step (c), wherein a lower dopamine transporter binding potential in step (c) indicates that the treatment is effective.

27. A method of determining whether an individual has a heightened probability of having ADHD, the method comprising:

assessing dopamine transporter in at least one region of said patient's central nervous system;

comparing said patient's dopamine transporter level to a normal dopamine transporter level, wherein a higher than normal level indicates a heightened probability of having ADHD.

28. The method of claim 27, further comprising administering to the patient a labeled dopamine transporter ligand before the assessing step, and wherein the assessing comprises determining the amount of labeled dopamine transporter ligand that is bound to dopamine transporter.

29. The method of claim 28, wherein the dopamine transporter ligand comprises a compound that binds to the dopamine transporter.

30. A method of monitoring the progress of a treatment for ADHD in a human patient, the method comprising assessing dopamine transporter in at least one region of said patient's central nervous system a plurality of times during said treatment.

31. The method of claim 31, further comprising administering to the patient a labeled dopamine transporter ligand before the assessing step, and wherein the assessing comprises determining the amount of labeled dopamine transporter ligand that is bound to dopamine transporter.

32. The method of claim 31, wherein the dopamine transporter ligand comprises a compound that binds to the dopamine transporter.

33. The method of claim 30, wherein the treatment comprises a pharmaceutical treatment.

34. The method of claim 33, wherein the pharmaceutical treatment comprises administration of a pharmaceutical selected from the group consisting of methylphenidate, pemoline, and an amphetamine.

35. The method of claim 34, wherein the assessing step comprises PET or SPECT imaging.